

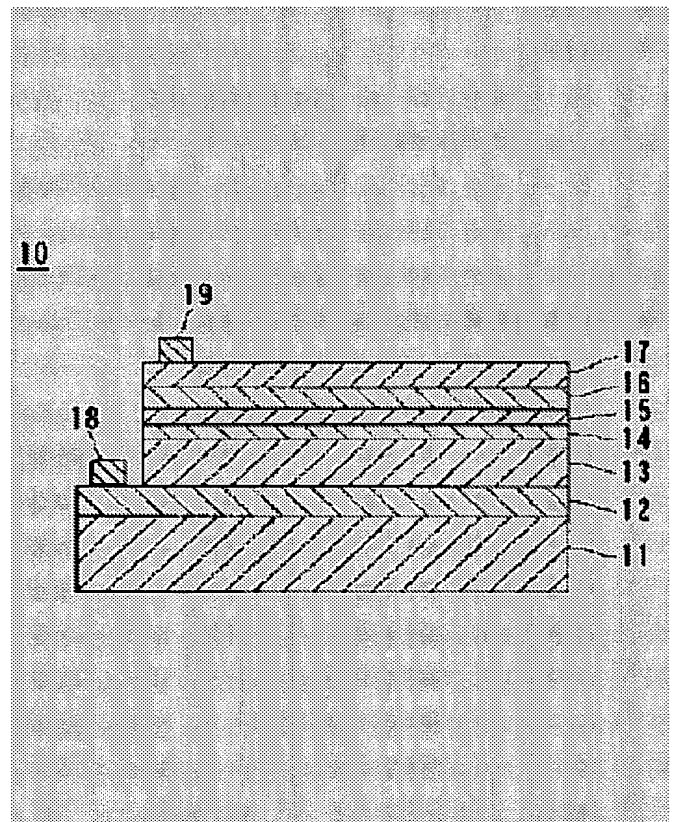
## SOLAR BATTERY AND MANUFACTURE THEREOF

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### Abstract of JP2000332273

**PROBLEM TO BE SOLVED:** To provide a solar battery having a high voltage characteristic by forming a compound semiconductor thin film between a light absorbing layer and a buffer layer, the semiconductor thin film having a large energy difference between the bottom of a conduction band and a Fermi level. **SOLUTION:** This solar battery includes a substrate 11, and a lower electrode film 12, a compound semiconductor thin film 13, a compound semiconductor thin film 14, a compound thin film (buffer layer) 15, a window layer 16 and an upper electrode film 17 which are laminated sequentially on the substrate 11. The film 13 is a semiconductor thin film which functions as a light absorbing layer, and contains a group Ib element, a group IIIb element, and a group VIb element. The film 14 contains a group Ib element, a group IIIb element, and a group VIb element and also contains sulfur at a higher composition ratio than that of the film 13.



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Partial Translation of JP 2000-332273

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[0047] The buffer layer 15 is formed of a compound semiconductor. For example, a thin film formed of at least one selected from ZnO, ZnS, ZnSe, Zn (O, OH), Zn (O, OH, S), Zn (O, Se), Zn (O, OH, Se) and  $\text{Zn}_x\text{Mg}_y\text{O}$  (wherein,  $0 < x < 1$ ,  $0 < y < 1$ ) can be used for the buffer layer 15. Herein, Zn (O, OH) means a compound including a Zn-O binding and a Zn-OH binding, and much the same is true on Zn (O, OH, S), Zn (O, Se), and Zn (O, OH, Se).

[0060] Then, as shown in Fig. 4 (c), the buffer layer 15, a window layer 16 and an upper electrode film 17 are formed on the compound semiconductor thin film 14. For example, the buffer layer 15 can be formed by a chemical deposition method, a vapor deposition method and a sputtering method or the like. For example, the window layer 16 and the upper electrode film 17 can be formed by the vapor deposition method and the sputtering method.

[0104] A Zn (O, OH, S) film (film thickness of 30 nm) as the buffer layer 15 was then formed by the chemical deposition method. So as to form the Zn (O, OH, S) film, a solution was prepared, obtained by mixing zinc acetate ( $\text{Zn}(\text{CH}_3\text{COO})_2$ ), thiourea ( $\text{NH}_2\text{CSNH}_2$ ), ammonium acetate ( $\text{CH}_3\text{COONH}_4$ ) and an ammonia water. The concentrations of the zinc acetate, thiourea, ammonium acetate and ammonia were respectively set to 0.02 M, 0.3 M, 0.1 M and 0.5 M.